

Claims

1. A metallurgical furnace, such as a blast furnace, melting or melt-reduction furnace, provided with a refractory lining and an outer furnace steel jacket (15), comprising copper cooling plates (10, 10'), wherein a cooling medium flows through the cooling plates arranged between the furnace steel jacket (15) and the refractory lining, wherein the cooling medium pipes (13, 14) of the copper cooling plate (10, 10') provided for supplying and removing the cooling medium are guided through the furnace steel jacket (15) to the exterior and are gas-tightly welded to the furnace steel jacket (15), characterized in that the copper cooling plate (10, 10') is connected free of play in all spatial directions to the furnace steel jacket (15), in addition to attachment by means of the cooling medium pipes (13, 14) welded to the furnace steel jacket (15), by at least one fixed-point fastening element (11), for example, a fastening bolt, that is welded to the furnace steel jacket (15).
2. The metallurgical furnace according to claim 1, characterized in that the copper cooling plate (10, 10') is additionally fastened fixedly to the furnace steel jacket (15) by at least one movable point fastening element (12), for example, a fastening screw, which allows thermal expansion movements of the copper cooling plate (10, 10') in the horizontal and vertical direction.
3. The metallurgical furnace according to claim 1 or 2,

characterized in that

one or more fixed-point fastening elements (11) are arranged within the upper and/or lower part of the copper cooling plate (10, 10') in immediate proximity of the cooling medium pipes (13, 14).

4. The metallurgical furnace according to claim 1 or 2, characterized in that one or more fixed-point fastening elements (11) are arranged at the center of the copper cooling plate (10, 10').
5. The metallurgical furnace according to claim 3 or 4, characterized in that at least some of the cooling medium pipes (13, 14) are welded without use of a compensator directly to the furnace steel jacket (15).